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ABSTRACT

This document discusses the author's solution to students' demands for smaller, more individual classes vs. administrative pressure, forced by enrollment and financial demands, for larger classes. In the 1970 fall semester at Cypress College (California) 150 students participated in an experiment in which an economics 1A class size was increased from 50 to approximately 100, but also included small seminars of 10 students each. It was found that a significant difference did exist between control and experimental groups on the basis of pre-test/post-test score gains and on semester score averages. The experimental group had a higher absence and withdrawal rate, yet scored higher; it also exhibited a more positive attitude response to course experiences. It is felt that the small seminar contact was largely responsible for the significant learning gain. (CA)

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"Class Size Effect on Community College Economic Education"

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[1971]

The Problem

"Students could learn more in smaller classes!" (Faculty) "I need individual attention!" (Student) -- Perhaps the reader, as the author, has heard these statements often and questioned their validity? It was toward testing such claims that this research was designed.(1)

The problem faced was the pressure for increased class size, forced by enrollment and financial demands, and the concommitant student demand for increased individual learning direction. And meeting such challenges by a 50-60 class size did not appear the answer. Such a size does not really permit either full-scale audio-visual presentation or a 1-1 meeting with the student.

A "solution" attempted by the author was to increase class size (to please administrator - some 100), but also include small seminars (to please student -- some 10) in a scheduling package. The student by enrolling in Economics 1A would thus meet for two hours per week in a large lecture section of 100, and once a week in a small seminar of 10. While the large lecture was devoted to basic description of economic theory (with full-scale audio-visual techniques), the seminar emphasized attention to students' individual learning difficulties and college concerns in general (Discussions ranged from computing elasticity coefficients to bicycle racks on campus to Viet Nam!).

While such an arrangement was not particularily "unique," the author desired an evaluation of learning gain/loss by such scheduling. -- The following sections describe the research design, test findings, and conclusions.

Research Designs

In order to evaluate learning rates, a control group of standard class size (50) was compared with the experimental class size group (100). Student enrollment, class meeting times, text and materials used, and instructor approach were all held constant in an attempt to isolate the impact of class size on learning differences. Variations between the control and experimental groups thus consisted only of the class size differences, and the use of seminars for the experimental group.

To test the learning differences between the control and experimental groups, the Test of Economic Understanding (TEU)[2] was used on a pre-test and post-test basis to measure learning achievement (See Table I for comparison of pre-test, post-test, and gains in mean test scores.). In addition, a comparison was made between the control and experimental groups on the basis of semester score averages. As the semester average was compiled from a weighted average of quizzes, unit exams, and final exam, such a comparison reflected overall learning achievement throughout the semester.

The research question asked, then, was whether a significant difference existed between control and experimental groups on the basis of pre-test/post-test score gains and on semester score averages?

Test Results

Table I tabulates test results relative to learning achievement comparisons between control and experimental groups, as measured by TEU and semester average scores.

Using a one-tail .05 level of significance test (required Z score of + 1.65), the learning achievement results can be summarized as:

1. There was no significant difference on Pre-Test TEU mean scores between control and experimental groups.

2. There was no significant difference on Post-Test TEU mean scores between control and experimental groups.

3. There was a significant difference on learning gain from Pre-Test to Post-Test TEU mean scores between control and experimental groups.

4. There was a significant difference on Semester Average mean scores between control and experimental groups.

Table I

"Learning Achievement Comparisons"

Comparison	Experimental Statistic (Mean Class Score)	σ	Control Statistic (Mean Class Score)	σ	Z-Score(1)
TEU(2)					
Pre-Test	23.4	6.25	23.7	6.29	-0.28
Post-Test	31.2	5.62	29.8	6.25	+1.25
Gain	+ 7.8	5.25	6.1	5.15	+1.77
Semester Average(3)					
Semester Score	90.1	4.15	82.1	5.92	+8.16

Notes:
1. A Z-score of +1.65 was required to reach a .05 level of significance on a one-tail test.
2. A maximum TEU score is 50.
3. A maximum semester average is 100.

Such test results would confirm that, for this very limited sample, increased class size with seminars treatment did produce significant learning gains. An especially interesting test result was the much greater level of significance for the semester average score achieved by experimental groups compared to control groups, than the Pre-Test/Post-Test TEU gain. Such difference could be hypothesized as due to intensive seminar discussion of material immediately and directly tested on course examinations, while the TEU measured overall subject concepts.

Perhaps of additional interest is the data assembled in Table II, compiled as a "by-product" of the learning achievement experiment. Notice that the experimental group had a higher absence and withdrawal rate (significant beyond the .01 level) than the control group, yet by Table I still scored at a higher Post-Test TEU score and semester average score result. In addition, the experimental group appeared to exhibit a more positive attitudinal response to course experiences (measured by check sheet of "low-fair-high-strong" levels by student evaluation), often citing seminar experiences as most valuable.

While not directly the focus of the experiment, Table II data is indeed interesting in the implicit question of the value of required lecture attendance, and in the positive student attitudes expressed. If maximum learning achievement were the basic course objective, it would appear that voluntary large lecture/small seminar attendance contributed to that objective.(3)

Table II

"Attendance and Attitude Data"

Comparison	Experimental	Control
Number of Absences	3697	2450
Total Days Possible	526	263
Total Days Absence	14.2%	10.9%
% Days Absence(1)		
Withdrawal Rate		
Students Starting	92	58
Students Completing	74	49
% Students Withdrawal(1)	19.6%	15.5%
Attitudes(2)		
Class Response	Strong	Fair
Instructor Contact	Strong	Low
Student Interest	High	High

Notes:
1. % is significantly different byond .01 level.
2. Obtained form student questionnaire response.

Conclusions

This experiment, conducted in the Fall Semester of 1970 on some 150 students (1 control group of 50 and 1 experimental group of 100), was surely limited, and thus of questionable generalization value. However, the text results obtained would attest to learning achievement gains possible under large class size conditions. One could conclude that, expecially on course-prepared examinations, students can preform at higher levels in large class size conditions.

It should be emphasized that the larger class size (100) also included small seminar (10) contact with the instructor. And in the opinion of the instructor and author, underscored by student response, such small seminar contact was largely responsible for the significant learning gain and favorable attitude response. For the small seminar sessions allowed reinforcement and enrichment contacts not readily available in the standard class size.

From this small study, therefore, one might tenatively conclude that large class size/small seminar scheduling may promote associated problems of enrollment pressure, learning gain, and individual student attention. However, a further and more conclusive experiment would involve class size comparison based on behavioral objective.(4) Such an experiment is planned by the author in the Fall Semester of 1971 and 1972.(5)

Bibliography

1. While few quantitative research studies are available on class size effect in economic education, one reference is Nelson, Wallace B., "An Experiment with Class Size in the Teaching of Elementary Economics," Educational Record 40 (October 1959), 330-341.

2. TEU is published by, and available from, Science Research Associates, Inc., 259 Erie Street, Chicago, Illinois, 60611 - Reorder #7-2860.

3. A somewhat similar research result in which doubt was implied as to the value of a lecture approach was reported by Attiyeh, R.E., Bach, G.L. and Lumsden, K.G., "The Efficiency of Programmed Learning in Teaching Economics: The Results of a Nationwide Experiment," American Economic Review 59 (May 1969).

4. For a concise introduction to behavioral objectives, see Mager, Robert F., Preparing Objectives For Programmed Instruction. Palo Alto, Calif.: Fearon Publishers, 1967.

5. The reader should be reminded that questions of class size effect are not "new." A history of such concern is reviewed by Bernard F. Haley in Lumsden, Keith G., ed., New Developments In The Teaching Of Economics. Englewood Cliffs N.J.: Prentice-Hall (1967), 12-14.

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